Time: 3 hours **Max. Marks: 80**

Note: 1. Assume suitable data if necessary
2. Figures to the right indicate full marks
3. Question No. 1 is compulsory
4. Solve any three out of the remaining five questions

Q1.	**Solve any four**	
A	What is the difference between Magnetostrictive and Piezoelectric transducers?	**5**
B	Explain Carbon Nanotube with properties.	**5**
C	Explain EDM process with its application	**5**
D	What do you mean by Thermoelectric materials?	**5**
E	Explain carbon Nanotube.	
F	What is Soft Matter? List the properties of it	**5**
Q2.		
A	Explain different types of non polymer based nanocomposites.	**5**
B	Classify the different types of Electroactive polymers.	**5**
C	Explain various tuning strategies for Split Ring Resonators.	**10**
Q3.		
A	Explain selective powder binding (SPB) process with neat sketch	**5**
B	List the application of Magneto-rheological Fluids.	**5**
C	Explain Stereo lithography (STL) process in detail with suitable diagrams.	**10**
Q4.		
A	Elaborate the application of smart materials.	**5**
B	Explain with neat sketches the one-way and two-way shape memory effect.	**5**
C	Explain the LIGA process in detail.	**10**
Q5.		
A	Write down the advantages of the Generative manufacturing processes.	**5**
B	Explain thermoelectric Energy Harvesting Technique with diagram.	**5**
C	Explain Hysteresis Loop and state advantages, disadvantages and application of Hysteresis Loop	**10**
Q 6.		
A	Explain Ion based Actuation in detail.	**5**
B	What is the difference between traditional and smart manufacturing?	**5**
C	Explain USM process and write advantages and disadvantages of USM	**10**

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